

In the Claims

Claim 1. (Currently amended) A catalyst for the selective front-end hydrogenation of acetylene comprising

an inorganic support, a palladium metal source, and a thallium metal source, wherein the palladium metal source comprises from about 0.001 to about 2 weight percent, and the thallium metal source comprises from about 0.001 to about 1 weight percent, wherein the weight percentages are based on the total weight of the catalyst, including the palladium and thallium, and wherein the concentration of palladium metal is not less than the concentration of thallium metal, wherein the ratio of the palladium metal to the thallium metal is from 5:1 to about 50:1.

Claim 2. (Original) The catalyst of Claim 1 wherein at least about 90 percent of the palladium metal source is concentrated within about 250 microns of a surface of the catalyst.

Claim 3. (Original) The catalyst of Claim 1 wherein the inorganic support is selected from the group consisting of alpha alumina, zinc oxide, nickel spinel and other low surface area catalyst support materials, and mixtures thereof, with a surface area less than about 100 m²/g.

Claim 4. (Original) The catalyst of Claim 1 formed in the

shape of a sphere, trihole trilobal, monolith, pellet, ring or tablet.

Claim 5. (Currently amended) The catalyst of Claim 1 wherein the support material has a BET surface area in the range of about 1 to about ~~100~~ 10 m²/g.

Claim 6. (Original) The catalyst of Claim 1 wherein the support material has a pore volume in the range of about 0.2 to about 0.7 cc/g.

Claim 7. (Original) The catalyst of Claim 1 wherein the palladium metal comprises from about 0.005 to about 0.05 weight percent of the catalyst, based on the total weight of the catalyst, including the palladium metal.

Claim 8. (Original) The catalyst of Claim 1 wherein the palladium metal comprises from about 0.01 to about 0.03 weight percent of the catalyst based on the total weight of the catalyst, including the palladium metal.

Claim 9. (Currently amended) The catalyst of Claim 1 wherein the thallium metal comprises from about 0.001 to about ~~0.01~~ 0.03 weight percent of the catalyst based on the total weight of the

catalyst, including the thallium metal.

Claim 10. Cancelled

Claim 11. Cancelled

Claim 12. (Original) The catalyst of Claim 1 wherein the ratio of the palladium metal to the thallium metal is from about 10:1 to about 20:1.

Claim 13. (Currently amended) A process for the manufacture of a catalyst for the selective hydrogenation of acetylene comprising preparing a low surface area catalyst support, impregnating the catalyst support with a palladium metal source, wherein the palladium metal source is selected from the group consisting of palladium salt and metallic palladium, and impregnating the palladium-impregnated catalyst support with a thallium metal source, wherein the thallium metal source is selected from the group consisting of a thallium salt and metallic thallium, ~~wherein the concentration of the thallium metal does not exceed the concentration of the palladium metal~~ wherein the ratio of the palladium metal to the thallium metal is from 5:1 to about 50:1.

Claim 14. (Original) The process of Claim 13 wherein the depth of penetration of the palladium metal source into the catalyst support is wherein about 90 percent of the palladium is present within about 250 microns of the surface of the catalyst material.

Claim 15. Cancelled

Claim 16. Cancelled

Claim 17. (Original) The process of Claim 13 wherein the ratio of the palladium metal to the thallium metal calculated as elemental metals, is from about 10:1 to about 20:1.

Claim 18. (Original) The process of Claim 13 further comprising reducing the catalyst by heating the catalyst in a reducing furnace under a reducing gas.

Claim 19. (Original) The process of Claim 18 wherein the reducing gas is selected from hydrogen, carbon monoxide or mixtures thereof.

Claim 20. (Original) A process for the selective acetylene hydrogenation in a front-end ethylene purification process comprising

preparing the palladium/thallium catalyst of Claim 1,
passing a feed stream comprising methane, ethylene, hydrogen,
carbon monoxide and acetylene over the catalyst.

Claim 21. (Original) The process of Claim 21 wherein the
amount of the acetylene contained in the feed stream is reduced to
less than about 1 ppm.

Basis for Amendments to the Claims

The Applicants have amended independent Claims 1 and 13 to incorporate the limitations of dependent Claims 11 and 16 into those independent claims. As the limitations were contained in dependent claims, no new subject matter is introduced by these amendments. Further, these limitations are also disclosed on page 12, lines 12 - 18 of the application as a preferred embodiment.

Claim 5 has been amended to lower the surface area of a preferred support to a range from 1 to 10 m²/g. Basis for this amendment is contained on page 9, lines 26 - 29, as the most preferred embodiment.

Claim 9 has been amended to change the quantity of the thallium metal that is present in the catalyst to a range from 0.001 to about 0.03 wt % of the catalyst. Basis for this amendment is contained on page 12, lines 6 - 11 as a preferred embodiment. See also Examples 5 - 7 in Table I on page 18.

No new subject matter is introduced by any of the amendments to the claims.